

DRINKING WATER SURVEILLANCE PROGRAM

DRESDEN
WATER TREATMENT
PLANT

REPORT FOR 1991 AND 1992

 Ontario

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**DRESDEN WATER TREATMENT PLANT
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REPORT FOR 1991 AND 1992**

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

DRESDEN WATER TREATMENT PLANT **1991 AND 1992 REPORT**

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Dresden water treatment plant is a conventional treatment plant which treats water from the Sydenham River. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. Powder activated carbon is applied for taste and odour control and pesticide reduction. This plant has a rated capacity of $2.3 \times 1000 \text{ m}^3/\text{day}$. The Dresden water treatment plant serves a population of approximately 2,500.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Dresden water treatment plant, for the sample years of 1991, and 1992, produced acceptable quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '-' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE	TREATED			MOONEY ST			RICHMOND SITE				
		RAW TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE
BACTERIOLOGICAL	33	27	.81	11	4	.36	12	5	.41	4	1	25
CHEMISTRY (FIELD)	29	29	100	56	56	100	138	126	91	48	44	91
CHEMISTRY (LABORATORY)	282	270	95	286	234	81	503	466	92	168	157	93
METALS	288	160	55	288	132	45	552	300	54	184	105	57
CHLOROAROMATICS	140	0	0	112	0	0	140	1	0	42	0	0
CHLOROPHENOLS	24	0	0	24	0	0	·	·	·	·	·	·
PESTICIDES AND PCB	335	3	0	265	·	3	1	220	1	0	67	0
PHENOLICS	12	0	0	12	1	8	·	·	·	·	·	·
POLYAROMATIC HYDROCARBONS	68	0	0	51	0	0	68	0	0	51	0	0
SPECIFIC PESTICIDES	93	1	1	73	0	0	1	0	0	1	0	0
VOLATILES	360	0	0	360	48	13	360	48	13	116	16	13
RADIONUCLIDES	28	8	28	28	8	28	·	·	·	·	·	·
TOTAL	1,692	498		1,566	486		1,994	947		681	323	

DRINKING WATER SURVEILLANCE PROGRAM

DRESDEN WATER TREATMENT PLANT 1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Dresden water treatment plant in the spring of 1985 as part of the alachlor pesticide study conducted in the Southwestern Region. Previous annual reports have been published for 1986, 1987, 1988, 1989 and 1990.

PLANT DESCRIPTION

The Dresden water treatment plant is a conventional treatment plant which treats water from the Sydenham River. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration and disinfection. Powder activated carbon is applied for taste and odour control and pesticide reduction. This plant has a rated capacity of $2.3 \times 1000 \text{ m}^3/\text{day}$. The Dresden water treatment plant serves a population of approximately 2,500.

The sample day flows ranged from $0.11 \times 1000 \text{ m}^3/\text{day}$ to $6.7 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polycyclic aromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOS). These objectives are applied to free flowing water. When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;**
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE
GUIDELINE VALUES; AND**
- POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water.

Standard plate count is a test used to supplement routine analysis for coliform bacteria. The limit for standard plate count (at 35°C after 48 hours) in the ODWOS is 500 counts/mL (based on a geometric mean of 5 or more samples). DWSP bacteriological analysis of treated and distributed water was limited to standard plate count.

Standard plate count (membrane filtration) exceeded the ODWO Aesthetic Objective of 500 counts/mL in 5 of 27 treated and distributed water samples with a maximum reported value of >2,400 counts/mL.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 7 of 26 treated and distributed water samples with a maximum reported value of 22.5°C.

CHEMISTRY (LABORATORY)

Calcium exceeded the European Economic Community Aesthetic Guideline Level of 100 mg/L in 8 of 28 treated and distributed water samples with a maximum reported value of 106.7 mg/L.

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions. Colour is measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 18 of 28 treated and distributed water samples with a maximum reported value of 14.0 HZU.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in all 28 treated and distributed water samples with a maximum reported value of 743 umho/cm.

The ODWOS indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable

balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L and also exceeded 200 mg/L in all 28 treated and distributed water samples with a maximum reported value of 342.0 mg/L.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Unit (FTU) and applies to the water leaving the treatment facility.

Turbidity exceeded the ODWO Maximum Acceptable Concentration of 1.0 FTU in 1 treated water sample with a maximum reported value of 1.08 FTU. This result was not confirmed by the corresponding and more reliable field turbidity result.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOS indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 7 of 28 treated and distributed water samples with a maximum reported value of 960 ug/L.

Manganese, in high concentrations, can contribute to laundry staining and undesirable tastes.

Manganese exceeded the ODWO Aesthetic Objective of 50.0 ug/L in 1 of 28 treated and distributed water samples with a maximum reported value of 320.0 ug/L.

ORGANIC

CHLOROAROMATICS

Hexachloroethane was found at a positive level in 1 of the 21 treated and distributed water samples analyzed. The maximum observed level was 12.0 ng/L. This was below the United States

Environmental Protection Agency Ambient Water Quality Criteria of 1,900 ng/L.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected above trace levels.

PESTICIDES AND PCB

Atrazine was found at positive levels in 3 of the 8 treated water samples analyzed. The maximum observed level was 850 ng/L. This was below the ODWO Interim Maximum Acceptable Concentration of 60,000 ng/L.

Other pesticides detected at trace levels included desethyl atrazine; metolachlor, cyanazine (bladex), metribuzin (sencor), and simazine. The dosage of powder activated carbon was not sufficient to reduce pesticide concentrations in the treated water.

Hexachlorocyclopentadiene was found at a positive level in 1 of the 8 treated and distributed water samples analyzed. The maximum observed level was 67.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs have been revised to replace the aesthetic phenolic objective with objectives for specific phenols.

Phenolics were found at a positive level in 1 of the 12 treated water samples analyzed. The maximum observed level was 2.8 ug/L.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that three parameters, 2,4-D, 2,4-D propionic acid and dicamba were detected at trace levels.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to

be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 28 treated and distributed water samples analyzed with a maximum level of 117.6 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

The presence of a number of pesticides which were detected at the Dresden water treatment plant indicates that this raw water source is adversely affected by agricultural activity. The addition of powder activated carbon at increased dosages are required to adequately reduce the levels of these contaminants.

The results are similar to those found in previous years.

No known health related guidelines were exceeded.

The Dresden water treatment plant, for the sample years of 1991, and 1992, produced acceptable quality water and this was maintained in the distribution system.

FIGURE 1
DRESDEN WATER TREATMENT PLANT

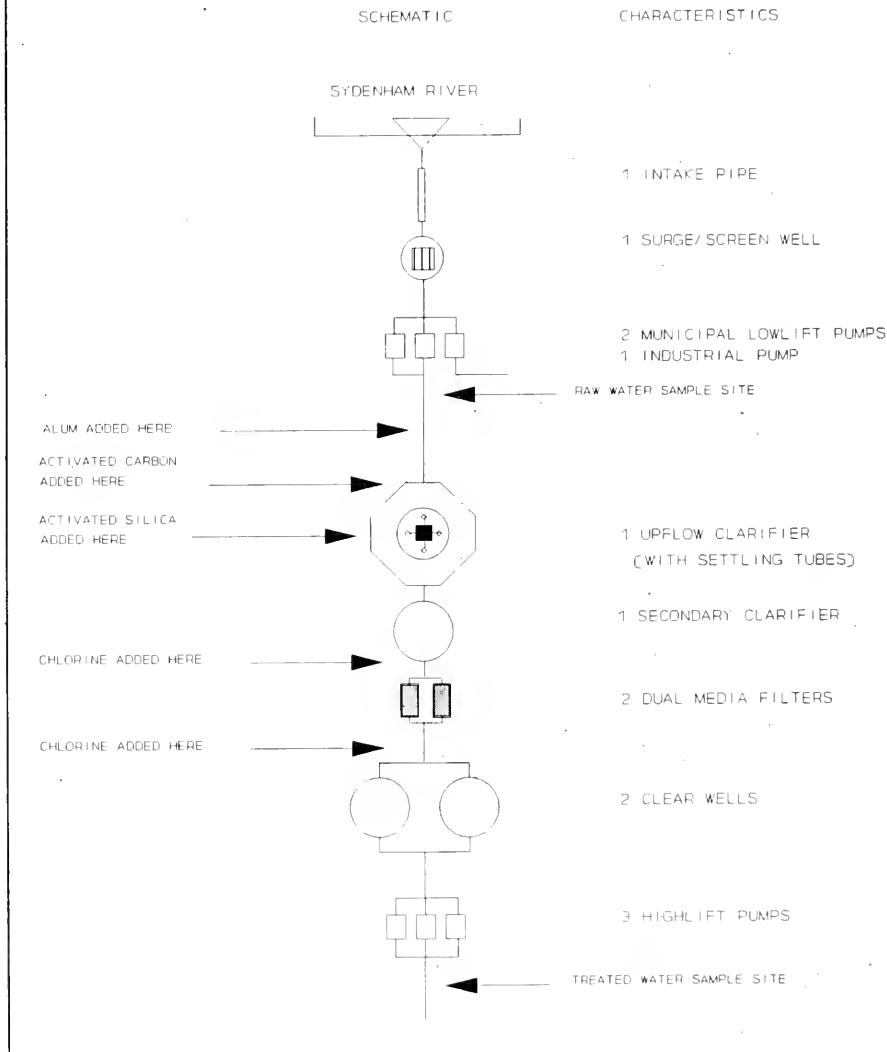


TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

PLANT NAME: DRESDEN WTP
WORKS #: 210000283
UTM #: 174038604715670

DISTRICT: SARNIA
REGION: SOUTHWEST
DISTRICT OFFICER: O. WIGLE

SUPERINTENDENT: CHUCK SHERMAN

ADDRESS: 749 PEEL ST. P.O. BOX 1120
DRESDEN, ONTARIO
N0P 1M0
519-683-6103

MUNICIPALITY: DRESDEN
AUTHORITY: PROVINCIAL

PLANT INFORMATION

PLANT VOLUME: 0.581 (X 1000 M3)
DESIGN CAPACITY: 3.819 (X 1000 M3/DAY)
RATED CAPACITY: 2.374 (X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
CANADIAN CANNERS	N/A
DRESDEN	2,477

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER	LOCATION	FREQUENCY
COMBINED CHLORINE RESIDUAL	FILTERED	4 TIMES/DAY
FREE CHLORINE RESIDUAL	TREATED	4 TIMES/DAY
TEMPERATURE	RAW	DAILY READING
TURBIDITY	LAB RAW RAW TREATED	DAILY READING DAILY READING 3 TIMES/DAY

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM DRESDEN WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY *	FLOW TIME (HRS) (1000M ³)	COAGULATION AID		TASTE & ODOR ACTIVATED CARBON POWDER	ACTIVATION SODIUM BICARBONATE	POST CHLORINATION CHLORINE
			COAGULATION ALUM LIQUID	SODIUM SILICATE			
91 FEB 12	.00	6.775		.02	7.30		6.30
91 APR 09	.00	4.110		.02	9.48		4.08
91 JUN 10	.50	.115			8.61		4.54
91 OCT 16							5.44
91 NOV 19	.00	1.710		.02			21.54
92 FEB 18	.00	1.990	60.45	.02			4.54
92 JUN 10	.50	2.270	35.06	10.40			3.17
92 OCT 14	.00	2.533	40.33	7.20			8.10
92 DEC 08	.00	2.109	4.23	5.00			2.05
					1.00		2.69
							1.45
							1.94

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
 - 1. Maximum Acceptable Concentration (MAC)
 - 1+. MAC for Total Trihalomethanes
 - 2. Interim Maximum Acceptable Concentration (IMAC)
 - 3. Aesthetic Objective (AO)
 - 3*. AO for Total Xylenes
 - 4. Recommended Operational Guideline
 - 5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)
 - 1. Maximum Acceptable Concentration (MAC)
 - 2. Proposed MAC
 - 3. Interim MAC
 - 4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
 - 1. Guideline Value (GV)
 - 2. Tentative GV
 - 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
 - 1. Maximum Contaminant Level (MCL)
 - 2. Suggested No-Adverse Effect Level (SNAEL)
 - 3. Lifetime Health Advisory
 - 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
 - 1. Health Related Guideline Level
 - 2. Aesthetic Guideline Level
 - 3. Maximum Admissible Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

• No Sample Taken
BDL Below Minimum Measurement Amount
<T Greater Than Detection Limit But Not Confident
(SEE INTERPRETATION OF RESULTS ABOVE)
> Results Are Greater Than The Upper Limit
<=> Approximate Result
!48 No Data: Sample Age Exceeded 48 Hours
!AR No Data: No Numeric Results
!AW No Data: Analysis Withdrawn
!BT No Data: Sample Broken In Transit
!CS No Data: Contamination Suspected
!EF No Data: Laboratory Equipment Failure
!IR No Data: Insufficient Sample
!IS No Data: Insufficient Sample
!LA No Data: Laboratory Accident
!NP No Data: No Procedure
!NR No Data: Sample Not Received
!OP No Data: Obscured Plate
!PE No Data: Procedure Error: Sample Discarded
!PR No Data: Preservative Required
!QU No Data: Quality Control Unacceptable
!RE No Data: Received Empty
!RO No Data: No Numeric Results
!SM No Data: Sample Missing
!SS No Data: Sample Improperly Preserved
!U No Data: Sample Unsuitable For Analysis
!UB No Data: Bottle Broken
!UN No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST.		DIST. SYSTEM RICHMOND ST.		DIST. SYSTEM RICHMOND ST FREE FLOW	STANDING STANDING
		FREE FLOW	STANDING	FREE FLOW	STANDING		
BACTERIOLOGICAL							
FECAL COLIFORM MF (CF/100ML)				DET'N LIMIT = 0		GUIDELINE = 0 (A1)	
1991 FEB	88						
1991 APR	12						
1991 JUN	76						
1991 AUG	8						
1991 OCT	12						
1991 NOV	20						
1992 MAY	280						
1992 JUN	60 <=>						
1992 AUG	90 <=>						
1992 OCT	130						
1992 DEC	100						
STANDARD PLATE CNT MF (CF/100ML)				DET'N LIMIT = 0		GUIDELINE = 500 (A3)	
1991 FEB		4 <=>		3 <=>		3 <=>	
1991 APR		7 <=>		2 <=>		8 <=>	
1991 JUN		65		2400 >		2200	
1991 AUG		5 <=>		1200			
1991 OCT		0 <=>		7 <=>		1 <=>	
1991 NOV		1 <=>		4 <=>			
1992 FEB				1 <=>			
1992 MAY		29				2 <=>	
1992 JUN			2 <=>			2400 >	
1992 AUG		430 A3C				2400 >	
1992 OCT		24					
1992 DEC		5 <=>		26			
TOTAL COLIFORM MF (CF/100ML)				DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)	
1991 FEB	15000						
1991 APR	3600						
1991 JUN	500 A3C						
1991 AUG	140 <=>						
1991 OCT	600 <=>						
1991 NOV	180 <=>						
1992 MAY	17000						
1992 JUN	600 <=>						
1992 AUG	3100 A3C						
1992 OCT	1100 A3C						
1992 DEC	8800						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

T	COLIFORM	BACTERIOLOGICAL	BACKGRD MF (CT/100ML)	DETIN LIMIT = 0	GUIDELINE = N/A		
					DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW
1991 FEB	50000						
1991 MAR	11000						
1991 APR	200000 A3C						
1991 JUN							
1991 AUG	48000 >						
1991 OCT	12900						
1991 NOV	6200 A3C						
1992 MAY	70000						
1992 JUN	44000 A3C						
1992 AUG	6200 A3C						
1992 OCT	45000 A3C						
1992 DEC	12000						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (FIELD) (MG/L)	DET N LIMIT = 0			GUIDELINE = N/A
			DIST. PLANT MOONEY ST FREE FLOW	DIST. PLANT MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	
FLD CHLORINE (COMB) (MG/L)						
1991 FEB	•	.600	.190	.080	.000	.100
1991 APR	•	.200	.100	.050	.000	.200
1991 JUN	•	.400	.200	.100	.000	.100
1991 AUG	•	.200	.230	.100	.000	.100
1991 OCT	•	.100	.200	.100	.000	.100
1991 NOV	•	1.000	.200	.000	.000	.
1992 FEB	•	.200	.200	.000	.000	.
1992 MAY	•	.300	.150	.000	.000	.
1992 JUN	•	.300	.200	.000	.000	.
1992 AUG	•	.300	.100	.000	.000	.
1992 OCT	•	.200	.200	.050	.050	.
1992 DEC	•
FLD CHLORINE FREE (MG/L)						
1991 FEB	•	.600	.100	.000	.100	.000
1991 APR	•	1.000	.100	.050	.100	.100
1991 JUN	•	.600	.000	.000	.100	.100
1991 AUG	•	.	.300	.000	.100	.
1991 OCT	•	1.100	.100	.000	.100	.000
1991 NOV	•	1.000	.100	.100	.	.
1992 FEB	•	.500	.100	.100	.	.
1992 MAY	•	.	.300	.000	.	.
1992 JUN	•	1.100	.100	.100	.	.
1992 AUG	•	.900	.100	.100	.	.
1992 OCT	•	1.000	.100	.100	.	.
1992 DEC	•
FLD CHLORINE (TOTAL) (MG/L)						
1991 FEB	•	1,000	.290	.080	.100	.100
1991 APR	•	1,200	.350	.100	.300	.300
1991 JUN	•	1,000	.100	.050	.100	.200
1991 AUG	•	.	.500	.100	.	.
1991 OCT	•	1.300	.330	.100	.200	.100
1991 NOV	•	1,100	.300	.100	.	.
1992 FEB	•	1,000	.300	.100	.	.
1992 MAY	•	.	.300	.100	.	.
1992 JUN	•	1,400	.250	.100	.	.
1992 AUG	•	.	.300	.100	.	.
1992 OCT	•	1,200	.200	.100	.	.
1992 DEC	•	1,200	.300	.100	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW		DIST. SYSTEM MOONEY ST STANDING		DIST. SYSTEM RICHMOND ST STANDING	
		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (A6)	DET'N LIMIT = N/A	GUIDELINE = 15 (A3)	DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)
CHEMISTRY (FIELD)							
FLD PH (OMNSLESS)		7.700	7.100	7.100	7.300	7.100	7.200
1991 FEB	7.700			7.500	7.500	7.500	7.400
1991 APR	8.200	7.500	7.400	7.500	7.600	7.600	7.600
1991 JUN	8.100	7.500	7.500	7.600	7.400	7.400	7.500
1991 AUG				7.500	7.500	7.500	7.500
1991 OCT	7.900	7.400	7.400	7.500	7.400	7.400	7.500
1991 NOV	7.700	7.500	7.500	7.500	7.500	7.500	7.500
1992 FEB		7.300	7.300	7.300	7.300	7.300	7.300
1992 MAY	7.800	6.800	6.800	6.800	6.800	6.800	6.800
1992 JUN	8.100	7.500	7.500	7.500	7.500	7.500	7.500
1992 AUG				7.500	7.500	7.500	7.500
1992 OCT	8.000	7.800	7.800	7.700	7.700	7.700	7.700
1992 DEC	8.400	8.000	8.000	7.700	7.700	7.800	7.800
FLD TEMPERATURE (DEG.C)							
1991 FEB	1.500	2.000	4.000	19.000	4.000	4.000	10.000
1991 APR	11.000	12.000	10.000	21.000	10.000	10.000	8.800
1991 JUN	21.000	22.500	21.000	21.500	16.000	16.000	18.000
1991 AUG			22.000	22.000			
1991 OCT	11.000	12.000	15.000	20.500	20.500	20.500	15.000
1991 NOV	6.500	7.000	9.500	19.000			
1992 FEB	3.000	6.000	4.000	21.500			
1992 MAY	14.000	15.000	11.000	19.000			
1992 JUN	21.500	21.500	18.000	20.000			
1992 AUG			20.500	21.000			
1992 OCT	11.500	13.000	15.000	21.000			
1992 DEC	4.500	4.000	8.000	22.000			
FLD TURBIDITY (FTU)							
1991 FEB	33.000	.330	.460	.480	.580	.580	.880
1991 APR	38.000	.220	.270	.390	1.580	1.580	1.110
1991 JUN	.740	.290	.320	.500	.960	.960	1.140
1991 AUG							
1991 OCT	29.000		.160	.220	.340	.360	.290
1991 NOV	15.200	.080	.160	.100	.520	.510	
1992 FEB	99.000	.230	.230	.100	.210	.210	
1992 MAY	63.000						
1992 JUN	53.000	.270	.230	.230	.690	.690	
1992 OCT	20.000	.300					
1992 DEC	9.000	.160	.380	.380	.260	.260	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATED PLANT FRE FLOW	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	CHEMISTRY (LABORATORY)		GUIDELINE = 30-500 (A4)
				ALKALINITY (MG/L)	DET'N LIMIT = 0.2	
1991 FEB	200, 700	177, 400	183, 100	179, 000	181, 100	181, 000
1991 APR	238, 500	226, 100	213, 900	209, 100	216, 400	217, 300
1991 JUN	239, 100	236, 300	224, 200	232, 100	229, 500	226, 700
1991 AUG	167, 000	156, 000	146, 700	155, 400	182, 400	184, 800
1991 OCT	194, 500	180, 700	182, 300	182, 400	182, 900	182, 900
1991 NOV	210, 300	205, 500	208, 000	207, 400	175, 800	149, 300
1992 FEB	148, 600	194, 000	148, 500	72, 000	100, 000	100, 000
1992 MAY	161, 200	148, 500	186, 500	196, 000	186, 000	186, 000
1992 JUN	204, 300	198, 800	209, 200	229, 700	213, 300	213, 300
1992 AUG	236, 300	260, 600	258, 100	259, 400	267, 800	264, 000
1992 OCT	256, 100	270, 100	270, 100	267, 800	264, 000	264, 000
1992 DEC	271, 600					
CALCIUM (MG/L)				CHEMISTRY (LABORATORY)		GUIDELINE = 100 (F2)
				CALCIUM (MG/L)	DET'N LIMIT = 0.20	
1991 FEB	89, 400	87, 300	88, 300	88, 300	87, 500	89, 900
1991 APR	102, 100	101, 400	100, 800	99, 100	97, 700	98, 600
1991 JUN	96, 400	102, 000	102, 000	103, 000	101, 000	101, 000
1991 AUG	58, 400	59, 000	60, 000	61, 200	73, 300	72, 800
1991 OCT	72, 900	72, 500	72, 600	73, 300	71, 000	72, 800
1991 NOV	90, 900	88, 900	89, 100	91, 000		
1992 FEB	77, 600	97, 300	99, 300			
1992 MAY	77, 800	83, 650	83, 800	92, 800		
1992 JUN	97, 000	94, 800	91, 900	93, 700		
1992 AUG	101, 200	93, 900	99, 500	97, 100		
1992 OCT	100, 400	103, 300	106, 700	107, 900		
1992 DEC	84, 700	98, 200	102, 000	108, 000		
CYANIDE (MG/L)				CHEMISTRY (LABORATORY)		GUIDELINE = 0.2 (A1)
				CYANIDE (MG/L)	DET'N LIMIT = 0.001	
16 SAMPLES	BDL	BDL				

TABLE 4 DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

CHLORIDE (MG/L)	CHEMISTRY (LABORATORY)												DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)
	TREATMENT PLANT			TREATMENT PLANT			DIST. SYSTEM			DIST. SYSTEM				
RAW	TREATED	FREE FLOW	MOONEY ST.	MOONEY ST.	FREE FLOW	MOONEY ST.	MOONEY ST.	FREE FLOW	RICHMOND ST.	RICHMOND ST.	RICHMOND ST.	FREE FLOW	RICHMOND ST.	STANDING
1991 FEB	22.800	24.700	25.100	25.000	25.600	25.200								
1991 APR	27.300	28.300	28.000	28.100	28.800	28.000	29.100	28.800						
1991 JUN	28.400	31.100	32.300	31.900	32.000	31.300	32.000	31.200	32.000	32.000	33.200			
1991 AUG	28.500	31.200	30.800	31.600	30.800	31.000	31.600	30.800						
1991 OCT	28.700	30.500	29.800	31.000	30.500	31.000	31.000	30.500	30.100	30.100	30.100			
1991 NOV	30.000	31.200	31.800	32.300	31.200	32.300	32.300	31.800						
1992 FEB	34.100	44.500	39.800	36.400	44.500	39.800	36.400	39.800						
1992 MAY	24.500	24.100	21.800	22.700	24.100	21.800	22.700	21.800						
1992 JUN	30.700	32.300	32.500	32.700	30.700	32.300	32.700	32.500						
1992 AUG	28.600	28.900	31.500	30.900	28.600	28.900	30.900	31.500						
1992 OCT	28.100	30.500	31.200	29.800	28.100	30.500	29.800	31.200						
1992 DEC	24.900	27.000	26.800	26.700	24.900	27.000	26.700	26.800						
COLOUR (RU)	CHEMISTRY (LABORATORY)												DET'N LIMIT = 0.50	GUIDELINE = 5 (A5)
1991 FEB	16.000	14.000	5.500	6.500	5.500	6.500	7.500	8.000	8.000	8.000	8.000	8.000		
1991 APR	7.500	4.000	4.000	4.500	4.000	4.500	7.000	7.000	7.000	7.000	7.000	7.000		
1991 JUN	15.000	10.000	10.000	10.500	10.000	10.500	11.500	11.500	11.500	11.500	11.500	11.500		
1991 AUG	10.500	5.000	5.000	5.500	5.000	5.500	4.000	4.000	4.000	4.000	4.000	4.000		
1991 OCT	9.500	4.000	4.000	4.500	4.000	4.500	4.500	4.500	4.500	4.500	4.500	4.500		
1991 NOV	7.000	4.000	4.000	4.500	4.000	4.500	5.000	5.000	5.000	5.000	5.000	5.000		
1992 FEB	BDL	5.000	5.000	6.500	5.000	6.500	8.000	8.000	8.000	8.000	8.000	8.000		
1992 MAY	23.000	7.000	7.000	2.500	7.000	2.500	4.000	4.000	4.000	4.000	4.000	4.000		
1992 JUN	22.000	7.500	7.500	8.000	7.500	8.000	9.000	9.000	9.000	9.000	9.000	9.000		
1992 AUG	19.500	11.000	11.000	9.500	19.500	9.500	8.000	8.000	8.000	8.000	8.000	8.000		
1992 OCT	11.500	6.000	6.000	8.000	11.500	8.000	8.000	8.000	8.000	8.000	8.000	8.000		
1992 DEC	13.000	7.500	7.000	8.500	13.000	7.500	8.500	8.500	8.500	8.500	8.500	8.500		
CONDUCTIVITY (UMHO/CM)	CHEMISTRY (LABORATORY)												DET'N LIMIT = 1.0	GUIDELINE = 400 (F2)
1991 FEB	547	563	570	563	570	563	574	571						
1991 APR	623	636	631	631	625	625	629	631						
1991 JUN	654	673	678	678	673	678	669	671						
1991 AUG	480	504	493	493	502	502	502	502						
1991 OCT	543	565	567	567	568	568	567	567						
1991 NOV	618	635	641	641	643	643	643	643						
1992 FEB	606	743	709	709	643	643	643	643						
1992 MAY	500	565	573	573	614	614	614	614						
1992 JUN	626	656	639	639	653	653	653	653						
1992 AUG	648	650	678	678	659	659	659	659						
1992 OCT	648	667	662	662	666	666	666	666						
1992 DEC	690	704	703	703	696	696	696	696						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
		MOONEY ST FREE FLOW	STANDING	MOONEY ST FREE FLOW	STANDING	RICHMOND ST FREE FLOW	STANDING
CHEMISTRY (LABORATORY)							
DISS. ORG. CARBON (MG/L)		DET'N LIMIT = 0.10		DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)	
1991 FEB	5,200	3,600	3,600	3,700	3,700	3,800	3,800
1991 APR	4,400	3,200	3,700	3,400	3,200	3,100	3,100
1991 JUN	5,300	5,000	4,900	5,000	4,900	4,900	4,900
1991 AUG	4,200	3,600	3,300	3,100	3,100	2,800	2,800
1991 OCT	3,500	2,900	2,900	2,900	2,900	2,600	2,600
1991 NOV	3,700	3,200	3,400	3,600	3,600	3,700	3,700
1992 FEB	4,400	3,800	3,500	3,700	3,700	3,700	3,700
1992 MAY	6,300	3,800	2,200	2,600	2,600	2,600	2,600
1992 JUN	5,000	4,300	4,200	4,200	4,200	4,200	4,200
1992 AUG	5,700	4,900	4,900	4,800	4,800	4,800	4,800
1992 OCT	3,900	3,800	3,700	3,800	3,700	3,700	3,700
1992 DEC	4,200	4,000	3,900	4,200	4,200	4,200	4,200
FLUORIDE (MG/L)							
		DET'N LIMIT = 0.01		DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
1991 FEB	.120	.100	.100	.100	.100	.100	.100
1991 APR	.120	.120	.120	.120	.120	.120	.120
1991 JUN	.160	.160	.140	.160	.160	.160	.160
1991 AUG	.140	.120	.120	.080	.080	.080	.080
1991 OCT	.120	.100	.100	.100	.100	.100	.100
1991 NOV	.120	.120	.120	.120	.120	.120	.120
1992 FEB	.140	.120	.100	.120	.120	.120	.120
1992 MAY	.200	.140	.100	.100	.100	.100	.100
1992 JUN	.160	.160	.160	.160	.160	.160	.160
1992 AUG	.160	.140	.160	.140	.140	.140	.140
1992 OCT	.120	.120	.120	.120	.120	.120	.120
1992 DEC	.040 <1	.080	.080	.080	.080	.080	.080
HARDNESS (MG/L)							
		DET'N LIMIT = 0.5		DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
1991 FEB	285,500	279,500	282,700	282,100	281,000	286,800	286,800
1991 APR	331,400	330,200	323,200	320,700	316,100	320,800	320,800
1991 JUN	312,000	325,000	326,000	328,000	322,000	322,000	322,000
1991 AUG	218,400	219,000	222,000	225,000	228,000	252,800	257,600
1991 OCT	257,000	255,900	256,700	258,000	263,900	278,000	278,000
1991 NOV	305,000	298,000	299,500	303,900	307,000	320,000	320,000
1992 FEB	257,000	331,400	318,000	288,000	288,000	288,000	288,000
1992 MAY	247,000	263,000	260,000	303,000	307,000	307,000	307,000
1992 JUN	130,000	311,000	303,000	309,800	309,800	345,000	345,000
1992 AUG	325,000	301,000	318,800	342,000	342,000	352,000	352,000
1992 OCT	328,000	334,000	321,000	330,000	330,000	332,000	332,000
1992 DEC	287,000						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOODY ST FREE FLOW	DET/N LIMIT = N/A	GUIDELINE = N/A		
				DIST. SYSTEM MOODY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHEMISTRY (LABORATORY)						
IONCAL (DINNSLESS)						
1991 FEB	1.033	1.025	.326	1.390	.253	2.157
1991 APR	.704 NAF	1.452 NAF	.277 NAF	.146 NAF	3.272 NAF	2.268 NAF
1991 JUN	4.814 NAF	.808 NAF	.569 NAF	.393 NAF	.851 NAF	2.343 NAF
1991 AUG	1.991	3.051	.258	1.441		
1991 OCT	1.679	1.138	.3.225	.602	2.294	.433
1991 NOV	1.325 NAF	.982 NAF	2.176 NAF	.2.468 NAF		
1992 FEB	3.915	3.229	.439	2.121		
1992 MAY	.402 NAF	2.536 NAF	1.725 NAF	1.714 NAF		
1992 JUN	1.238	.993	1.199	.350		
1992 AUG	.223	2.157	.254	1.379		
1992 OCT	3.660	4.281	1.519	.552		
1992 DEC	24.170	11.060	7.883	2.785		
POTASSIUM (MG/L)			DET/N LIMIT = 0.01	GUIDELINE = 10 (F2)		
1991 FEB	2.960	2.480	2.580	2.700	2.580	2.710
1991 APR	2.660	2.510	2.560	2.700	2.510	2.650
1991 JUN	3.800	3.600	3.650	3.650	3.550	3.700
1991 AUG	2.940	2.870	2.950	2.950		
1991 OCT	3.880	3.830	3.850	3.820	3.780	3.790
1991 NOV	3.430	3.370	3.440	3.600		
1992 FEB	4.390	2.840	3.030	3.040		
1992 MAY	4.880	2.679	2.703	2.728		
1992 JUN	3.440	3.160	3.170	3.190		
1992 AUG	4.003	3.911	3.737	3.937		
1992 OCT	3.730	3.710	3.660	3.750		
1992 DEC	3.149	3.135	3.126	3.231		
LANGELIERS INDEX (DINNSLESS)			DET/N LIMIT = N/A	GUIDELINE = N/A		
1991 FEB	1.038	.613	.871	.852	.662	.714
1991 APR	1.324 NAF	1.077 NAF	.961 NAF	.964 NAF	1.062 NAF	1.038 NAF
1991 JUN	1.209	1.078	1.034	1.064	1.040	1.041
1991 AUG	.800	.743	.504	.647		
1991 OCT	.887	.900	.544	.579	.536	.611
1991 NOV	1.239	1.159	1.125	1.102		
1992 FEB	.921	1.218	1.015	.899		
1992 MAY	.957	.857	.017	.406		
1992 JUN	1.358	1.211	1.191	1.190		
1992 AUG	1.325	1.049	1.086	1.032		
1992 OCT	1.276	1.295	1.236	1.292		
1992 DEC	1.186	1.177	1.130	1.139		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)	DIST. SYSTEM MOONEY ST FREE FLOW		DIST. SYSTEM MOONEY ST STANDING		GUIDELINE = 30.0 (F2)
			DET'N LIMIT = 0.1	DET'N LIMIT = 0.20	DET'N LIMIT = 0.1	DET'N LIMIT = 0.20	
MAGNESIUM (MG/L)	SODIUM (MG/L)						
1991 FEB	15.150	14.950	15.100	15.000	15.150	15.150	15.150
1991 APR	18.600	18.750	17.350	17.800	17.450	18.100	18.100
1991 JUN	17.400	17.100	17.200	17.200	17.100	17.100	17.000
1991 AUG	17.650	17.400	17.400	17.600	17.600	17.600	17.600
1991 OCT	18.200	18.200	18.300	18.250	18.350	18.450	18.450
1991 NOV	18.950	18.500	18.750	18.600	18.600	18.600	18.600
1992 FEB	15.300	21.400	17.200	14.800	14.800	14.800	14.800
1992 MAY	12.840	13.080	13.360	13.740	13.740	13.740	13.740
1992 JUN	18.200	18.100	18.900	17.800	17.800	17.800	17.800
1992 AUG	17.500	16.080	16.860	16.380	16.380	16.380	16.380
1992 OCT	18.700	18.500	18.500	18.500	18.500	18.500	18.500
1992 DEC	18.400	18.500	18.400	17.900	17.900	17.900	17.900
GUIDELINE = 200 (F2)							
AMMONIUM TOTAL (MG/L)							
1991 FEB	.110	.002 <T	.002 <T	.004 <T	.004 <T	.012	.020
1991 APR	.010	.004 <T	.002 <T	.006 <T	.006 <T	.012	.008 <T
1991 JUN	.002 <T	.004 <T	.012	.004 <T	.004 <T	.012	.004 <T
1991 AUG	.080	.006 <T	.008 <T	.024	.024	.012	.008 <T
1991 OCT	.048	.002 <T	.002 <T	.004 <T	.004 <T	.014	.008 <T
1991 NOV	.006 <T	.004 <T	.018	.018	.018	.060	...
1992 FEB	.168	.018	.018	.026	.026	.038	...
1992 MAY	.044	.030	.026	.014	.014	.014	...
1992 JUN	BDL	.002 <T	.006 <T	.014	.014	.014	...
1992 AUG	.032	.006 <T	.008 <T	.004 <T	.004 <T	.010	...
1992 OCT	.020	.004 <T	BDL	BDL	BDL	.018	...
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
GUIDELINE = 0.05 (F2)							

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	
NITRATE (TOTAL) (MG/L)	CHEMISTRY (LABORATORY)	DET/N LIMIT = 0.001	GUIDELINE = 1.0 (A1)	NITRATE (TOTAL) (MG/L)	CHEMISTRY (LABORATORY)	DET/N LIMIT = 0.005	GUIDELINE = 10.0 (A1)
1991 FEB	.030	BOL	.001 <1	.001 <1	BOL	.001 <1	.001 <1
1991 APR	.028	BOL	.001 <1	.002 <1	.001 <1	.003 <1	.002 <1
1991 JUN	.065	.001 <1	.003 <1	.001 <1	.001 <1	.013	.013
1991 AUG	.012	.001 <1	.001 <1	.001 <1	.001 <1	.001 <1	.001 <1
1991 OCT	.040	.002 <1	.002 <1	.002 <1	.002 <1	.002 <1	.002 <1
1991 NOV	.008	BOL	.001 <1	.001 <1	.001 <1	.001 <1	.001 <1
1992 FEB	.087	.003 <1	.003 <1	.003 <1	.003 <1	.007	.007
1992 MAY	.129	.002 <1	.001 <1	.003 <1	.001 <1	.003 <1	.003 <1
1992 JUN	.066	.003 <1	.003 <1	.004 <1	.004 <1	.005	.005
1992 AUG	.020	.003 <1	.004 <1	.004 <1	.004 <1	.005	.005
1992 OCT	.016	.002 <1	.002 <1	.002 <1	.002 <1	.003 <1	.003 <1
1992 DEC	.069	.001 <1	.001 <1	.001 <1	.001 <1	.003 <1	.003 <1
1991 FEB	5.890	5.680	5.770	5.660	5.820	5.620	5.620
1991 APR	5.210	5.240	5.230	5.280	5.240	5.330	5.330
1991 JUN	6.600	6.670	7.770	7.600	6.830	7.920	7.920
1991 AUG	.100	.130	.095	.115	.115	.115	.115
1991 OCT	.315	.260	.290	.260	.280	.280	.285
1991 NOV	1.770	1.790	1.800	1.860	1.860	1.860	1.860
1992 FEB	10.400	9.880	9.980	10.200	10.200	10.200	10.200
1992 MAY	7.400	7.340	6.820	6.880	6.880	6.880	6.880
1992 JUN	7.970	7.950	8.400	7.880	7.880	7.880	7.880
1992 AUG	6.120	7.960	7.420	7.420	7.420	7.420	7.420
1992 OCT	4.550	4.580	4.720	4.660	4.660	4.660	4.660
1992 DEC	6.090	6.080	5.950	5.960	5.960	5.960	5.960
1991 FEB	.950	.430	.410	.440	.470	.480	.480
1991 APR	.580	.370	.390	.430	.430	.460	.460
1991 JUN	.830	.600	.640	.640	.620	.720	.720
1991 AUG	.530	.320	.360	.340	.340	.280	.290
1991 OCT	.580	.290	.280	.310	.410	.410	.410
1991 NOV	.490	.360	.350	.540	.540	.540	.540
1992 FEB	.940	.470	.470	.430	.430	.430	.430
1992 MAY	.860	.590	.580	.580	.580	.580	.580
1992 JUN	.640	.450	.440	.490	.490	.490	.490
1992 AUG	.890	.620	.610	.630	.630	.630	.630
1992 OCT	.650	.470	.490	.540	.540	.540	.540
1992 DEC	.650	.540	.490	.570	.570	.570	.570

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

PH (DINNLESS)	CHEMISTRY (LABORATORY)		DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (A4)			
	TREATMENT PLANT RAW	TREATMENT PLANT TREATED			DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW
1991 FEB	8.250	7.890	8.130	8.120	7.930	7.970	
1991 APR	8.410	8.190	8.100	8.120	8.210	8.180	
1991 JUN	8.320	8.170	8.150	8.160	8.150	8.160	
1991 AUG	8.270	8.240	8.020	8.130			
1991 OCT	8.200	8.250	7.890	7.920	7.890	7.950	
1991 NOV	8.430	8.370	8.330	8.300			
1991 DEC	8.330	8.420	8.250	8.260			
1992 FEB	8.320	8.230	7.670	7.910			
1992 JUN	8.530	8.410	8.430	8.400			
1992 AUG	8.420	8.230	8.200	8.190			
1992 OCT	8.340	8.340	8.270	8.320			
1992 DEC	8.300	8.230	8.170	8.160			
PHOSPHORUS FIL. REACT (MG/L)		DET'N LIMIT = 0.0005		GUIDELINE = N/A		GUIDELINE = N/A	
1991 FEB	.054	.001	<1				
1991 APR	.021	.000	<1				
1991 JUN	.057	.017					
1991 AUG	.005	.001	<1				
1991 OCT	.016	.001	<1				
1991 NOV	.003	.000	<1				
1992 FEB	.058	.006					
1992 MAY	.047	.001	<1				
1992 JUN	.021	.001	<1				
1992 AUG	.031	.001	<1				
1992 OCT	.002 <1	.001	<1				
1992 DEC	.015	.009					
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.40 (F2)		GUIDELINE = 0.40 (F2)	
1991 FEB	.100	.006	<1				
1991 APR	.057	.004	<1				
1991 JUN	.102	.023					
1991 AUG	.049	.008	<1				
1991 OCT	.048	.006	<1				
1991 NOV	.025	.009	<1				
1992 FEB	.188	.008	<1				
1992 MAY	1.020	.003	<1				
1992 JUN	.087	.003	<1				
1992 AUG	.097	.011					
1992 OCT	.042	.009	<1				
1992 DEC	.038	.016					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOODY ST FREE FLOW	DIST. SYSTEM MOODY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	CHEMISTRY (LABORATORY)		DET'N LIMIT = N/A	GUIDELINE = 500 (A3)
						RESIDUE FILTRATE (MG/L)	SULPHATE (MG/L)		
1991 FEB	356.000 CRO	366.000 CRO	371.000 CRO	366.000 CRO	373.000 CRO	371.000 CRO	371.000 CRO	371.000 CRO	371.000 CRO
1991 APR	405.000 CRO	413.000 CRO	410.000 CRO	406.000 CRO	409.000 CRO	410.000 CRO	410.000 CRO	410.000 CRO	410.000 CRO
1991 JUN	425.000 CRO	437.000 CRO	441.000 CRO	437.000 CRO	435.000 CRO	439.000 CRO	439.000 CRO	439.000 CRO	439.000 CRO
1991 AUG	312.000 CRO	328.000 CRO	320.000 CRO	326.000 CRO	326.000 CRO	326.000 CRO	326.000 CRO	326.000 CRO	326.000 CRO
1991 OCT	353.000 CRO	367.000 CRO	369.000 CRO	369.000 CRO	369.000 CRO	370.000 CRO	370.000 CRO	370.000 CRO	370.000 CRO
1991 NOV	413.000 CRO	417.000 CRO	417.000 CRO	418.000 CRO	418.000 CRO	418.000 CRO	418.000 CRO	418.000 CRO	418.000 CRO
1992 FEB	394.000 CRO	483.000 CRO	461.000 CRO	461.000 CRO	461.000 CRO	461.000 CRO	461.000 CRO	461.000 CRO	461.000 CRO
1992 MAY	335.000 CRO	367.000 CRO	372.000 CRO	359.000 CRO	359.000 CRO	359.000 CRO	359.000 CRO	359.000 CRO	359.000 CRO
1992 JUN	407.000 CRO	426.000 CRO	415.000 CRO	424.000 CRO	424.000 CRO	424.000 CRO	424.000 CRO	424.000 CRO	424.000 CRO
1992 AUG	421.000 CRO	422.000 CRO	441.000 CRO	428.000 CRO	428.000 CRO	428.000 CRO	428.000 CRO	428.000 CRO	428.000 CRO
1992 OCT	421.000 CRO	434.000 CRO	430.000 CRO	433.000 CRO	433.000 CRO	433.000 CRO	433.000 CRO	433.000 CRO	433.000 CRO
1992 DEC	448.000 CRO	458.000 CRO	457.000 CRO	452.000 CRO	452.000 CRO	452.000 CRO	452.000 CRO	452.000 CRO	452.000 CRO
SULPHATE (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)		SULPHATE (MG/L)		GUIDELINE = 500 (A3)	
1991 FEB	48.890	70.260	70.870	71.310	71.350	71.350	71.350	71.350	71.350
1991 APR	62.210	75.870	78.940	80.260	76.570	77.480	77.480	77.480	77.480
1991 JUN	52.550	57.350	63.380	58.620	59.080	63.240	63.240	63.240	63.240
1991 AUG	48.160	65.400	66.140	65.880	65.880	65.880	65.880	65.880	65.880
1991 OCT	60.110	78.310	75.790	77.030	76.940	75.350	75.350	75.350	75.350
1991 NOV	81.460	83.940	89.030	90.710	90.710	90.710	90.710	90.710	90.710
1992 FEB	66.380	95.860	93.260	86.940	86.940	86.940	86.940	86.940	86.940
1992 MAY	49.520	90.250	163.330	159.780	159.780	159.780	159.780	159.780	159.780
1992 JUN	64.680	79.430	77.640	79.790	79.790	79.790	79.790	79.790	79.790
1992 AUG	52.900	62.840	69.000	66.620	66.620	66.620	66.620	66.620	66.620
1992 OCT	57.940	62.890	61.620	61.600	61.600	61.600	61.600	61.600	61.600
1992 DEC	58.090	61.070	61.620	60.560	60.560	60.560	60.560	60.560	60.560
TURBIDITY (FTU)		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)		TURBIDITY (FTU)		GUIDELINE = 1.0 (A1)	
1991 FEB	33.000 RRV	1.080 RRV	.710	1.060 RRV	.820	1.090 RRV	1.090 RRV	1.090 RRV	1.090 RRV
1991 APR	33.000	.230 <T	.330	.500	1.160 RRV	.930	.930	.930	.930
1991 JUN	65.000	.310	.460	.470	4.500 RRV	.980	.840	.840	.840
1991 AUG	11.000	.470	.590	.590	.520	.680	.640	.640	.640
1991 OCT	13.300	.410	.390	.390	.680	.780	.780	.780	.780
1991 NOV	12.400	.330	.510	.510	.590	.590	.590	.590	.590
1992 FEB	96.000	.160 <T	.100 <T	.100 <T	.420	.420	.420	.420	.420
1992 MAY	200.000 >	.680	.370	.370	.890	.890	.890	.890	.890
1992 JUN	81.000	.520	.370	.370	.700	.700	.700	.700	.700
1992 AUG	50.000	.580	.590	.590	.840	.840	.840	.840	.840
1992 OCT	10.900	.430	.420	.420	.610	.610	.610	.610	.610
1992 DEC	-	.400	.450	.450	.610	.610	.610	.610	.610

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOODY ST FREE FLOW		DIST. SYSTEM MOODY ST STANDING		DIST. SYSTEM RICHMOND ST FREE FLOW		DIST. SYSTEM RICHMOND ST STANDING	
		SILVER (UG/L)	SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
METALS									
					DET'N LIMIT = 0.05	DET'N LIMIT = 0.10			
ALUMINUM (UG/L))								
1991 FEB	280,000	67,000	16,000	84,000	15,000	18,000			
1991 APR	290,000	64,000	30,000	72,000	12,000	28,000			
1991 JUN	480,000	120,000	86,000	62,000	62,000	44,000			
1991 AUG	130,000	65,000	960,000	55,000	55,000				
1991 OCT	220,000	26,000	25,000	75,000	26,000				
1991 NOV	190,000	82,000	66,000	170,000					
1992 FEB	730,000	36,000	27,000	160,000					
1992 MAY	3381,000	41,000	12,000	12,000					
1992 JUN	890,000	110,000	92,000	150,000					
1992 AUG	320,000	120,000	120,000	120,000					
1992 OCT	150,000	170,000	140,000	170,000					
1992 DEC	84,000	53,000	47,000	74,000					
ARSENIC (UG/L)	)				DET'N LIMIT = 0.10				
1991 FEB	.660 <T	.160 <T	.310 <T	.240 <T					
1991 APR	.540 <T	.350 <T	.350 <T	.390 <T					
1991 JUN	.250 <T	.290 <T	.200 <T	.140 <T					
1991 AUG	2,000	1,100	1,300	.970 <T					
1991 OCT				.760 <T					
1991 NOV	.780 <T	.680 <T	.860 <T	.700 <T					
1992 FEB	1,100	.660 <T	.550 <T	1,100					
1992 MAY	.620 <T	.260 <T	.220 <T	.260 <T					
1992 JUN	1,400	.870 <T	.670 <T	.920 <T					
1992 AUG	1,800	.940 <T	1,200	1,000 <T					
1992 OCT	1,100	1,200	.960 <T	.960 <T					
1992 DEC	.400 <T	.390 <T	.550 <T	.390 <T					

GUIDELINE = 100 (A4)

GUIDELINE = 25 (A1)

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	METALS ($\mu\text{g/L}$)	DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)		DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
			DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING				
1991 FEB	32,000	BARIUM ($\mu\text{g/L}$)	21,000	21,000	25,000	21,000	22,000	22,000	27,000	27,000
1991 APR	38,000		30,000	29,000	30,000	30,000	27,000	27,000	37,000	39,000
1991 JUN	50,000		42,000	42,000	40,000	40,000	37,000	37,000	37,000	37,000
1991 AUG	41,000		38,000	40,000	38,000	40,000	37,000	37,000	37,000	37,000
1991 OCT	44,000		40,000	38,000	40,000	40,000	39,000	39,000	39,000	39,000
1991 NOV	48,000		36,000	36,000	43,000	43,000	36,000	36,000	36,000	36,000
1992 FEB	45,000		33,000	31,000	35,000	35,000	31,000	31,000	31,000	31,000
1992 MAY	90,000		32,000	53,000	51,000	51,000	51,000	51,000	51,000	51,000
1992 JUN	65,000		39,000	41,000	41,000	41,000	39,000	39,000	39,000	39,000
1992 AUG	48,000		37,000	36,000	38,000	38,000	36,000	36,000	36,000	36,000
1992 OCT	45,000		43,000	42,000	44,000	44,000	42,000	42,000	42,000	42,000
1992 DEC	40,000		30,000	29,000	33,000	33,000	30,000	30,000	30,000	30,000
1991 FEB	21,000	BORON ($\mu\text{g/L}$)	27,000	29,000	27,000	27,000	28,000	28,000	28,000	28,000
1991 APR	39,000		28,000	40,000	39,000	40,000	40,000	40,000	40,000	40,000
1991 JUN	36,000		38,000	37,000	40,000	40,000	40,000	40,000	40,000	40,000
1991 AUG	42,000		46,000	44,000	45,000	45,000	45,000	45,000	45,000	45,000
1991 OCT	37,000		56,000	52,000	52,000	52,000	52,000	52,000	52,000	52,000
1991 NOV	54,000		54,000	52,000	52,000	52,000	52,000	52,000	52,000	52,000
1992 FEB	27,000		28,000	28,000	29,000	29,000	29,000	29,000	29,000	29,000
1992 MAY	31,000		31,000	30,000	30,000	30,000	31,000	31,000	31,000	31,000
1992 JUN	44,000		36,000	40,000	39,000	39,000	39,000	39,000	39,000	39,000
1992 AUG	120,000		99,000	58,000	100,000	100,000	100,000	100,000	100,000	100,000
1992 OCT	41,000		45,000	47,000	45,000	45,000	45,000	45,000	45,000	45,000
1992 DEC	30,000		27,000	30,000	28,000	28,000	28,000	28,000	28,000	28,000
1991 FEB	.070 <T	BERILLIUM ($\mu\text{g/L}$)	BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1991 APR	BOL		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1991 JUN	.070 <T		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1991 AUG	BOL		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1991 OCT	BOL		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1991 NOV	.060 <T		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1992 FEB	.140 <T		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1992 MAY	.440 <T		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1992 JUN	.160 <T		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1992 AUG	.140 <T		.120 <T	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1992 OCT	BOL		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL
1992 DEC	BOL		BOL	BOL	BOL	BOL	BOL	BOL	BOL	BOL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. - SYSTEM		DIST. - SYSTEM		DIST. - SYSTEM	
		MOONEY ST FREE FLOW	STANDING	MOONEY ST FREE FLOW	STANDING	RICHMOND ST FREE FLOW	RICHMOND ST STANDING
METALS							
CADMIUM (UG/L)	)			DET/N LIMIT = 0.05		GUIDELINE = 5.0 (A1)	
1991 FEB	BDL	BDL	BDL	.080 <T	BDL	.070 <T	
1991 APR	BDL	BDL	BDL	.060 <T	BDL	.060 <T	
1991 JUN	BDL	BDL	BDL	.070 <T	BDL	.120 <T	
1991 AUG	BDL	BDL	BDL	.070 <T	BDL	BDL	
1991 OCT	BDL	BDL	BDL	.070 <T	BDL	BDL	
1991 NOV	BDL	BDL	BDL	.060 <T	BDL	.070 <T	
1992 FEB	BDL	.220 <T	.070 <T	.100 <T	.100 <T	.100 <T	
1992 MAY	.150 <T	BDL	BDL	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	
1992 AUG	BDL	.090 <T	BDL	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	.060 <T	BDL	BDL	
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	
COBALT (UG/L)							
1991 FEB	.360 <T	.100 <T	.090 <T	.110 <T	.100 <T	.150 <T	
1991 APR	.470 <T	.180 <T	.180 <T	.190 <T	.250 <T	.250 <T	
1991 JUN	BDL	BDL	BDL	BDL	.040 <T	BDL	
1991 AUG	.330 <T	.190 <T	.190 <T	.220 <T	.220 <T	.220 <T	
1991 OCT	.400 <T	.150 <T	.150 <T	.170 <T	.100 <T	.120 <T	
1991 NOV	.320 <T	.180 <T	.190 <T	.190 <T	.130 <T	.130 <T	
1992 FEB	1.300	.610	.370 <T	.370 <T	.370 <T	.370 <T	
1992 MAY	2.500	.270 <T	.340 <T	.340 <T	.320 <T	.320 <T	
1992 JUN	BDL	.130 <T	.220 <T	.220 <T	.220 <T	.220 <T	
1992 AUG	.430 <T	.150 <T	.200 <T	.200 <T	.140 <T	.140 <T	
1992 OCT	.360 <T	.250 <T	.280 <T	.280 <T	.280 <T	.280 <T	
1992 DEC	.200 <T	.170 <T	.270 <T	.270 <T	.180 <T	.180 <T	
CHROMIUM (UG/L)							
1991 FEB	1,000 <T	3,200 <T	3,600 <T	2,500 <T	3,200 <T	1,100 <T	
1991 APR	3,700 <T	.530 <T	3,000 <T	2,900 <T	3,000 <T	2,900 <T	
1991 JUN	.880 <T	BDL	BDL	.810 <T	.700 <T	BDL	
1991 AUG	2,800 <T	2,700 <T	2,400 <T	2,500 <T	2,500 <T	3,700 <T	
1991 OCT	.690 <T	5,800	5,800 <T	BDL	6,200	6,200	
1991 NOV	5,200	3,800 <T	4,700 <T	4,700 <T	BDL	BDL	
1992 FEB	1,300 <T	.810 <T	BDL	BDL	BDL	BDL	
1992 MAY	3,300 <T	BDL	BDL	BDL	BDL	BDL	
1992 JUN	1,300 <T	BDL	BDL	BDL	BDL	BDL	
1992 AUG	6,300	5,200	1,600 <T	5,100	5,100	5,100	
1992 OCT	2,300 <T	11,000	4,800 <T	2,400 <T	2,400 <T	2,400 <T	
1992 DEC	2,100 <T	.950 <T	1,700 <T	.600 <T	.600 <T	.600 <T	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT RAW	TREATMENT TREATED	PLANT FREE FLOW	DIST. SYSTEM		DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
			DET'N LIMIT	0.50			
COPPER (UG/L))						
1991 FEB	9.700	1.500 <T	3.300 <T	65.000	26.000		410.000
1991 APR	13.000	1.700 <T	4.700 <T	79.000	31.000		310.000
1991 JUN	13.000	3.000 <T	5.500	34.000	23.000		320.000
1991 AUG	16.000	2.500 <T	6.800	54.000			
1991 OCT	12.000	2.400 <T	7.400	75.000	90.000		670.000
1991 NOV	13.000	1.800 <T	6.200	76.000			
1992 FEB	7.900	2.100 <T	7.000	100.000			
1992 MAY	11.000	3.100 <T	27.000	450.000			
1992 JUN	14.000	2.100 <T	8.500	120.000			
1992 AUG	14.000	3.300 <T	14.000	140.000			
1992 OCT	3.100 <T	2.000 <T	9.900	110.000			
1992 DEC	4.000 <T	1.500 <T	11.000	110.000			
IRON (UG/L))						
1991 FEB	380.000	BDL	BDL	BDL	71.000		100.000
1991 APR	400.000	6.300 <T	BDL	11.000 <T	180.000		120.000
1991 JUN	720.000	6.300 <T	BDL	BDL	11.000 <T		88.000
1991 AUG	240.000	6.700 <T	40.000 <T	7.500 <T			
1991 OCT	400.000	7.300 <T	6.600 <T	12.000 <T			
1991 NOV	290.000	17.000 <T	BDL	15.000 <T			
1992 FEB	880.000	16.000 <T	8.500 <T	31.000 <T			
1992 MAY	1300.000	BDL	27.000 <T	13.000 <T			
1992 JUN	630.000	BDL	8.500 <T	79.000			
1992 AUG	410.000	BDL	8.100 <T	17.000 <T			
1992 OCT	250.000	BDL	BDL	8.700 <T			
1992 DEC	220.000						
MERCURY (UG/L))						
24 SAMPLES	BDL	BDL					

DET'N LIMIT = 6.00

GUIDELINE = 300 (A3)

DET'N LIMIT = 0.02

GUIDELINE = 1.0 (A1)

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM		GUIDELINE = 50.0 (A3)
		MOONEY ST FREE FLOW	STANDING	MOONEY ST FREE FLOW	STANDING	
METALS						
MANGANESE (UG/L)	)	11,000	8,100	16,000	12,000	13,000
1991 FEB	24,000	15,000	6,900	11,000	16,000	16,000
1991 APR	37,000	5,600	8,200	5,300	.570	12,000
1991 JUN	57,000	28,000	320,000	25,000	13,000	12,000
1991 AUG	74,000	22,000	7,900	17,000	23,000	22,000
1991 OCT	57,000	7,800	5,700	7,500	12,000	12,000
1991 NOV	30,000	6,500	29,000	25,000	13,000	13,000
1992 FEB	79,000	16,000	29,000	25,000	13,000	13,000
1992 MAY	160,000	51,000	4,700	11,000	11,000	11,000
1992 JUN	66,000	11,000	4,400	9,600	10,000	10,000
1992 AUG	41,000	6,700	5,800	10,000	10,000	10,000
1992 OCT	33,000	24,000	17,000	16,000	16,000	16,000
1992 DEC	36,000					
MOLYBDENUM (UG/L)						
	)					GUIDELINE = N/A
1991 FEB	.400 <T	1,100	1,100	1,100	1,200	1,100
1991 APR	.640	1,500	1,500	1,400	1,500	1,600
1991 JUN	.990	2,400	2,500	2,700	2,000	2,500
1991 AUG	2,400	2,800	2,400	2,800	2,800	2,800
1991 OCT	.980	1,700	1,800	1,800	1,700	1,600
1991 NOV	1,200	1,400	1,500	1,400	1,500	1,600
1992 FEB	.430 <T	1,700	1,500	1,500	1,500	1,500
1992 MAY	.210 <T	2,100	1,100	1,100	1,100	1,100
1992 JUN	.900	2,600	2,800	2,800	2,700	2,700
1992 AUG	1,000	2,100	2,400	2,400	2,200	2,200
1992 OCT	.990	1,800	1,800	1,800	1,600	1,600
1992 DEC	.920	1,300	1,300	1,300	1,200	1,200
NICKEL (UG/L)						
	)					GUIDELINE = 350 (03)
1991 FEB	.590 <T	.550 <T	.630 <T	1,800 <T	BDL	14,000
1991 APR	1,600 <T	1,300 <T	2,900	4,000	2,900	4,100
1991 JUN	BDL	BDL	BDL	.460 <T	.490 <T	1,500 <T
1991 AUG	3,600	.710 <T	1,800 <T	1,900 <T	1,900 <T	1,900 <T
1991 OCT	1,700 <T	.390 <T	1,100 <T	2,000 <T	.790 <T	6,600
1991 NOV	.820 <T	BDL	.400 <T	1,600 <T	3,500	3,500
1992 FEB	3,800	3,300	2,700	2,700	2,500	2,500
1992 MAY	5,300	BDL	.960 <T	1,500 <T	2,100	2,100
1992 JUN	2,800	1,600 <T	3,100	4,100	3,700 <T	3,700 <T
1992 AUG	3,900	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

LEAD (UG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)	
			DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
1991 FEB	.470 <T	BOL	.160 <T	.160 <T	.350 <T	.350 <T
1991 APR	.600	.120 <T	.160 <T	.2700	.320 <T	4,000
1991 JUN	1,000	.190 <T	.310 <T	.950	.120 <T	12,000
1991 AUG	.380 <T	.150 <T	.410 <T	1,800		
1991 OCT	.480 <T	.080 <T	.360 <T	1,800		
1991 NOV	.630	.090 <T	.270 <T	3,700		
1992 FEB	1,900	.150 <T	.250 <T	9,300		
1992 MAY	5,500	.480 <T	2,000	31,000		
1992 JUN	1,700	.150 <T	.710	9,700		
1992 AUG	.760	.590	.600	6,300		
1992 OCT	.440 <T	1,100	.430 <T	5,700		
1992 DEC	.190 <T	.060 <T	.370 <T	4,300		

ANTIMONY (UG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DET'N LIMIT = 0.05		GUIDELINE = 146 (A4)	
			DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
1991 FEB	.330 <T	.560	.590	.580	.650	.650
1991 APR	.250 <T	.490 <T	.590	.530	.520	.610
1991 JUN	.360 <T	.640	.640	.860	.720	.850
1991 AUG	.540	.550	.540	.740		
1991 OCT	.410 <T	.630	.720	.580	.670	.730
1991 NOV	.440 <T	.510	.600	.510		
1992 FEB	.360 <T	.580	.650	.770		
1992 JUN	.070 <T	.370 <T	.400 <T	.400 <T		
1992 AUG	.190 <T	.310 <T	.430 <T	.360 <T		
1992 OCT	.230 <T	.280 <T	.340 <T	.400 <T		
1992 DEC	.400 <T	.480 <T	.570	.640		

SELENIUM (UG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)	
			DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
1991 FEB	BOL	1,100 <T	1,400 <T	1,400 <T	1,300 <T	1,100 <T
1991 APR	BOL	.800	1,800 <T	1,100 <T	1,500 <T	1,300 <T
1991 JUN	1,300 <T	1,500 <T	1,400 <T	1,700 <T	1,600 <T	1,400 <T
1991 AUG	BOL	BOL	BOL	BOL		
1991 OCT	BOL	BOL	BOL	BOL		
1991 NOV	BOL	BOL	BOL	BOL		
1992 FEB	BOL	BOL	2,000 <T	2,100 <T		
1992 MAY	1,200 <T	BOL	BOL	1,100 <T		
1992 JUN	BOL	1,800 <T	1,100 <T	1,900 <T		
1992 AUG	1,200 <T	1,800 <T	2,300 <T	1,300 <T		
1992 OCT	BOL	1,100 <T	1,700 <T	1,500 <T		
1992 DEC	BOL					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
		MOONEY ST FREE FLOW	STANDING	MOONEY ST FREE FLOW	STANDING	RICHHMOND ST FREE FLOW	STANDING
METALS (UG/L)							
				DET'N LIMIT = 0.10		GUIDELINE = N/A	
STRONTIUM (UG/L)	)			190.000	200.000	190.000	190.000
1991 FEB	200.000	190.000		230.000	230.000	230.000	190.000
1991 APR	250.000	230.000		230.000	230.000	230.000	230.000
1991 JUN	250.000	230.000		180.000	180.000	180.000	240.000
1991 AUG	190.000	180.000		180.000	180.000	180.000	180.000
1991 OCT	180.000	180.000		180.000	180.000	180.000	180.000
1991 NOV	250.000	230.000		230.000	230.000	230.000	230.000
1992 FEB	230.000	250.000		230.000	230.000	230.000	230.000
1992 MAY	190.000	190.000		190.000	190.000	190.000	190.000
1992 JUN	250.000	240.000		240.000	240.000	240.000	240.000
1992 AUG	250.000	220.000		220.000	220.000	220.000	220.000
1992 OCT	270.000	270.000		270.000	270.000	270.000	270.000
1992 DEC	240.000	240.000		240.000	240.000	240.000	240.000
TITANIUM (UG/L)							
				DET'N LIMIT = 0.50		GUIDELINE = N/A	
1991 FEB	12.000	6.800		7.000	7.800	7.900	7.200
1991 APR	12.000	7.700		8.600	9.500	8.000	8.800
1991 JUN	8.700	6.300		5.800	5.500	5.500	5.400
1991 AUG	3.200	<T		1.100	<T	1.300	<T
1991 OCT	5.500	2.600		2.600	<T	2.400	<T
1991 NOV	6.900	3.000	<T	3.200	<T	3.900	<T
1992 FEB	10.000	7.600		5.000	5.000	6.300	
1992 MAY	30.000	17.000		15.000	15.000	18.000	
1992 JUN	20.000	8.600		8.900	8.900	8.700	
1992 AUG	23.000	16.000		17.000	17.000	16.000	
1992 OCT	7.000	5.300		5.100	5.100	5.500	
1992 DEC	13.000	11.000		11.000	11.000	11.000	
THALLIUM (UG/L)							
				DET'N LIMIT = 0.05		GUIDELINE = 13 (D4)	
1991 FEB	BDL	BDL		BDL	BDL	BDL	BDL
1991 APR	BDL	BDL		BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL		BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL		0.080	<T	BDL	BDL
1991 OCT	BDL	BDL		BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL		BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL		BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL		BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL		BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL		BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL		BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL		BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOODY ST FREE FLOW	DIST. SYSTEM MOODY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	
URANIUM (UG/L)	)	DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)		
1991 FEB	2,000	1,800	1,800	1,900	1,800	1,700
1991 APR	2,200	2,200	2,000	2,000	2,000	2,000
1991 JUN	2,300	2,400	2,200	2,600	2,600	2,300
1991 AUG	940	850	900	.870		
1991 OCT	1,100	1,100	.970	1,000	1,100	
1991 NOV	1,600	1,900	1,800	1,900	1,900	1,100
1992 FEB	2,100	2,500	2,100	1,700		
1992 MAY	2,000	1,600	.160 <T	.460 <T		
1992 JUN	1,900	2,300	2,500	2,400		
1992 AUG	2,300	2,300	2,400	2,300		
1992 OCT	2,200	2,600	2,600	2,400		
1992 DEC	2,400	2,300	2,300	2,000		

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOODY ST FREE FLOW	DIST. SYSTEM MOODY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	
VANADIUM (UG/L)	)	DET'N LIMIT = 0.05		GUIDELINE = N/A		
1991 FEB	1,000	1,200	1,100	1,200	.790	.650
1991 APR	.760	1,100	1,100	1,400	.470 <T	.510
1991 JUN	1,600	1,200	1,400	1,300	.490 <T	.630
1991 AUG	1,500	1,800	2,500	1,800		
1991 OCT	.860	.830	.890	.930		.430 <T
1991 NOV	.750	.710	.670	1,100		
1992 FEB	1,600	.920	.840	1,100		
1992 MAY	2,600	.810	.380 <T	.560		
1992 JUN	2,000	1,600	1,600	1,800		
1992 AUG	1,800	2,000	2,100	2,000		
1992 OCT	.980	.920	.980	1,200		
1992 DEC	.460 <T	.460	.530	.770		

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOODY ST FREE FLOW	DIST. SYSTEM MOODY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	
ZINC (UG/L)	)	DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)		
1991 FEB	11,000	12,000	20,000	100,000	4,400	94,000
1991 APR	12,000	20,000	24,000	100,000	4,500	47,000
1991 JUN	13,000	6,800	18,000	39,000	.690 <T	37,000
1991 AUG	9,400	13,000	33,000	93,000		
1991 OCT	9,400	9,400	4,100	36,000	2,700	50,000
1991 NOV	16,000	6,700	4,300	35,000		
1992 FEB	25,000	17,000	3,600	41,000		
1992 MAY	29,000	19,000	11,000	63,000		
1992 JUN	18,000	7,200	3,200	17,000		
1992 AUG	9,800	6,600	3,700	20,000		
1992 OCT	5,700	7,000	2,500	14,000		
1992 DEC	5,400	8,400	4,000	19,000		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHLORAROMATICS HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = 450 (D4)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
1234-TETCLOROBENZENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
1235-TETCLOROBENZENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5,000		GUIDELINE = 10000 (1)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
1245-TETCLOROBENZENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = 38000 (D4)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = 10 (C1)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CHLORODAROMATICS HEXACHLOROETHANE (NG/L)			DET'N LIMIT = 1,000		GUIDELINE = 1900 (D4)	
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	3,000 <T	3,000 <T	BDL	BDL	BDL
1991 JUN	BDL	1AW	1AW	AW	BDL	BDL
1991 AUG	1AW	1AW	1AW	AW	BDL	BDL
1991 OCT	1AW	1AW	1AW	AW	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	3,000 <T	BDL	BDL	1,000 <T	BDL	BDL
1992 MAY	BDL	BDL	4,000 <T	BDL	BDL	BDL
1992 JUN	BDL	BDL	3,000 <T	5,000 <T	BDL	BDL
1992 AUG	BDL	BDL	11S	BDL	BDL	BDL
1992 OCT	BDL	1,000 <T	1,000 <T	2,000 <T	BDL	BDL
1992 DEC	BDL					
OCTACHLOROSTYRENE (NG/L)			DET'N LIMIT = 1,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
PENTACHLOROBENZENE (NG/L)			DET'N LIMIT = 1,000		GUIDELINE = 74000 (D4)	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
236-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
245-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
26A-TRICHLOROTOLUENE (NG/L)			DET'N LIMIT = 5,000		GUIDELINE = N/A	
31 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	OIST. SYSTEM RICHMOND ST FREE FLOW	OIST. SYSTEM RICHMOND ST STANDING
CHLOROPHENOLS					
234-TRICHLOROPHENOL (NG/L)			DET'N LIMIT = 100.0		GUIDELINE = N/A
8 SAMPLES	BDL	BDL			
2345-1,2,3-TRICHLOROPHENOL (NG/L)					
			DET'N LIMIT = 20.0		GUIDELINE = N/A
8 SAMPLES	BDL	BDL			
2356-1,2,3-TRICHLOROPHENOL (NG/L)					
			DET'N LIMIT = 10.0		GUIDELINE = N/A
8 SAMPLES	BDL	BDL			
245-TRICHLOROPHENOL (NG/L)					
			DET'N LIMIT = 100.0		GUIDELINE = 2600000 (D4)
8 SAMPLES	BDL	BDL			
246-TRICHLOROPHENOL (NG/L)					
			DET'N LIMIT = 20.0		GUIDELINE = 5000 (A1)
1991 JUN	BDL	INR			
1991 AUG	115	BDL			
1991 NOV	BDL	80,000 <1			
1992 JUN	BDL	BDL			
1992 OCT	BDL	70,000 <1			
PENTACHLOROPHENOL (NG/L)					
			DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)
8 SAMPLES	BDL	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
ALDRIN (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 700 (A1)
ALPHA BHC (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 700 (G)
BETA BHC (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 300 (G)
LINDANE (GAMMA BHC) (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 4000 (A1)
1991 FEB		BDL	BDL	BDL	BDL
1991 APR		BDL	BDL	BDL	3,000 <T
1991 JUN		3,000 <T	IAW	3,000 <T	3,000 <T
1991 AUG		IAW	IAW	IAW	IAW
1991 OCT		IAW	IAW	IAW	IAW
1991 NOV		BDL	BDL	BDL	BDL
1992 FEB		1,000 <T	BDL	BDL	BDL
1992 MAY		BDL	BDL	BDL	BDL
1992 JUN		3,000 <T	BDL	4,000 <T	4,000 <T
1992 AUG		BDL	2,000 <T	1,000 <T	1,000 <T
1992 OCT		BDL	1.1S	BDL	BDL
1992 DEC		BDL	BDL	BDL	BDL
ALPHA CHLORDANE (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 7000 (A1)
GAMMA CHLORDANE (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 7000 (A1)
DIELDRIN (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 700 (A1)
METHOXYCHLOR (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 900000 (A1)
ENDOSULFAN 1 (NG/L)	31 SAMPLES	BDL	BDL	BDL	GUIDELINE = 74000 (D4)

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MCNEEY ST FREE FLOW	DIST. SYSTEM MCNEEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
ENDOSULFAN 11 (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = 74000 (04.) BDL	
ENDRIN (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = 1600 (03) BDL	
ENDOSULFAN SULPHATE (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = N/A BDL	
HEPTACHLOR EPOXIDE (NG/L) 25 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 BDL	GUIDELINE = 3000 (A1) BDL	
HEPTACHLOR (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 BDL	GUIDELINE = 3000 (A1) BDL	
MIREX (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = N/A BDL	
OXYCHLORDANE (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 2,000 BDL	GUIDELINE = N/A BDL	
O,P-DDT (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = 30000 (A1) BDL	
PCB (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 20,00 BDL	GUIDELINE = 3000 (A2) BDL	
P,P-DDD (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = 30000 (A1) BDL	
P,P-DDT (NG/L) 31 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 BDL	GUIDELINE = 30000 (A1) BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	01ST. SYSTEM RICHMOND ST FREE FLOW	01ST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB					
TOXAPHENE (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 500.0	GUIDELINE = 50000 (A1)
27 SAMPLES					BOL
AMETRINE (NG/L)				DET'N LIMIT = 50.0	GUIDELINE = 300000 (03)
18 SAMPLES	BOL	BOL	BOL		
ATRAZINE (NG/L)				DET'N LIMIT = 50.0	GUIDELINE = 60000 (A2)
1991 FEB	490.000 <T	510.000			
1991 APR	140.000 <T	115			
1991 JUN	3010.000	1NR			
1991 AUG	1AW	1AW			
1991 OCT	BOL	BOL			
1991 NOV	BOL	BOL			
1992 FEB	1SM	1SM			
1992 MAY	170.000 <T	130.000			
1992 JUN	900.000	850.000			
1992 AUG	520.000	840.000			
1992 OCT	90.000 <T	80.000			
1992 DEC	60.000 <T	90.000 <T			
ATRATONE (NG/L)				DET'N LIMIT = 50.0	GUIDELINE = N/A
18 SAMPLES	BOL	BOL	BOL		
CYANAZINE (BLADEX) (NG/L)				DET'N LIMIT = 100.0	GUIDELINE = 10000 (A2)
1991 FEB	BOL	BOL	BOL		
1991 APR	BOL	BOL	115		
1991 JUN	2000.000 <T	1NR	1NR		
1991 AUG	1AW	1AW	1AW		
1991 OCT	1QU	1QU	1QU		
1991 NOV	1QU	1QU	1QU		
1992 FEB	1SM	1SM	1SM		
1992 MAY	BOL	BOL	BOL		
1992 JUN	410.000 <T	360.000	360.000		
1992 AUG	BOL	BOL	BOL		
1992 OCT	BOL	BOL	BOL		
1992 DEC	BOL	BOL	BOL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DET'N SYSTEM MOONEY ST FREE FLOW	DET'N SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
PESTICIDES AND PCB						
DESETHYL ATRAZINE (NG/L)					DET'N LIMIT = 200.0	GUIDELINE = 60000 (A2)
1991 FEB	230.000 <T		260.000 <T			
1991 APR	BDL		BDL			
1991 JUN	460.000 <T		NR			
1991 AUG	IAW		IAW			
1991 OCT	IQU		IQU			
1991 NOV	IQU		IQU			
1992 FEB	ISM		ISM			
1992 MAY	BDL		BDL			
1992 JUN	BDL		BDL			
1992 AUG	250.000 <T		380.000 <T			
1992 OCT	BDL		BDL			
1992 DEC	BDL		BDL			
DESETHYL SIMAZINE (NG/L)					DET'N LIMIT = 200.0	GUIDELINE = 10000 (A2)
16 SAMPLES	BDL		BDL			
PROMETONE (NG/L)					DET'N LIMIT = 50.000	GUIDELINE = 52500 (D3)
14 SAMPLES	BDL		BDL			
PROPAZINE (NG/L)					DET'N LIMIT = 50.000	GUIDELINE = 700000 (D3)
14 SAMPLES	BDL		BDL			
PROMETRYNE (NG/L)					DET'N LIMIT = 50.000	GUIDELINE = 1000 (A2)
18 SAMPLES	BDL		BDL			
METRIBUZIN (SENCOR) (NG/L)					DET'N LIMIT = 100.0	GUIDELINE = 80000 (A1)
1991 FEB	BDL		BDL			
1991 APR	BDL		BDL			
1991 JUN	570.000 <T		NR			
1991 AUG	IAW		IAW			
1991 OCT	IQU		IQU			
1991 NOV	IQU		IQU			
1992 FEB	ISM		ISM			
1992 MAY	BDL		BDL			
1992 JUN	570.000 <T		350.000 <T			
1992 AUG	BDL		150.000 <T			
1992 OCT	BDL		BDL			
1992 DEC	BDL		BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

SIMazine (ng/L)	PESTICIDES AND PCB	DETIN LIMIT = 50.00				GUIDELINE = 10000 (A2)
		TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	
1991 FEB	BDL	BDL	BDL	BDL	BDL	
1991 APR	BDL	BDL	11S	BDL	BDL	
1991 JUN	BDL	BDL	INR	BDL	BDL	
1991 AUG	1AW	1AW	1AW	BDL	BDL	
1991 OCT	1OU	1OU	1OU	BDL	BDL	
1991 NOV	1OU	1OU	1OU	BDL	BDL	
1992 FEB	1SM	1SM	1SM	BDL	BDL	
1992 MAY	BDL	BDL	BDL	50.000 <1	50.000 <1	
1992 JUN	50.000 <1	50.000 <1	BDL	BDL	BDL	
1992 AUG	BDL	BDL	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	BDL	BDL	
.....						
ALACHLOR (LASSO) (ng/L)		DETIN LIMIT = 500.0				GUIDELINE = 5000 (A2)
14. SAMPLES		BDL	BDL	BDL	BDL	
.....						
MEFOLACHLOR (NG/L)		DETIN LIMIT = 500.0				GUIDELINE = 50000 (A2)
1991 FEB		BDL	BDL	BDL	BDL	
1991 APR	BDL	BDL	11S	BDL	BDL	
1991 JUN	4380.000 <1	4380.000 <1	INR	BDL	BDL	
1991 AUG	1AW	1AW	1AW	BDL	BDL	
1991 OCT	BDL	BDL	BDL	BDL	BDL	
1991 NOV	BDL	BDL	BDL	BDL	BDL	
1992 FEB	1SM	1SM	1SM	BDL	BDL	
1992 MAY	BDL	BDL	BDL	2830.000 <1	2830.000 <1	
1992 JUN	2830.000 <1	2830.000 <1	BDL	1170.000 <1	1170.000 <1	
1992 AUG	600.000 <1	600.000 <1	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	BDL	BDL	
1992 DEC	BDL	BDL	BDL	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT RAW	TREATMENT PLANT TREATED	PLANT FREE FLOW	DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM FREE FLOW	STANDING	GUIDELINE = 206000 (D4)
			MOONEY ST	STANDING	MOONEY ST	STANDING			
PESTICIDES AND PCB									
HEXADECYCLOPENTADIEN (NG/L)	)		DET/N LIMIT = 5.00						
1991 FEB	BOL	19,000 <1	8,000 <1						10,000 <1
1991 APR	BOL	34,000 <1	67,000						16,000 <1
1991 JUN	1QU	1AW	1QU						1QU
1991 AUG	1AW	1AW	1AW						1AW
1991 OCT	1AW	1AW	1AW						1AW
1991 NOV	BOL	50,000 <1	BOL						
1992 FEB	1QU	1QU	1QU						
1992 MAY	1QU	1QU	1QU						
1992 JUN	1QU	1QU	1QU						
1992 AUG	1QU	1QU	1QU						
1992 OCT	1QU	1S	1S						
1992 DEC	1QU	1QU	1QU						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

PHENOLICS (UG/L)	PHENOLICS)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST (FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
				DET'N LIMIT =	0.2				
1991 FEB	BDL			.400 < T					
1991 APR	BDL			.800 < T					
1991 JUN	.400 < T			.800 < T					
1991 AUG	BDL			BDL					
1991 OCT	.800 < T			2,800					
1991 NOV	.800 < T			.400 < T					
1992 FEB	.800 < T			BDL					
1992 MAY	BDL			BDL					
1992 JUN	.600 < T			BDL					
1992 AUG	BDL			BDL					
1992 OCT	BDL			BDL					
1992 DEC	BDL			.600 < T					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
POLYAROMATIC HYDROCARBONS					
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
FLUORANTHENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
PYRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
BENZO(A)ANTHRAENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
CHRYSENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
BENZO(B) FLUORANTHEN (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
PERYLENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
BENZO(K) FLUORANTHEN (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)	
14. SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

RAW	TREATMENT PLANT TREATED	TREATMENT PLANT FREE FLOW	DIST. SYSTEM MOORE ST STANDING	DIST. SYSTEM MOORE ST FREE FLOW	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
<hr/>						
	POLYAROMATIC HYDROCARBONS					
	BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
<hr/>						
	DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
<hr/>						
	INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
<hr/>						
	BENZO(C) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
<hr/>						
	CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
14 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL
<hr/>						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM	
		MOONEY ST FREE FLOW	MOONEY ST STANDING	RICHMOND ST FREE FLOW	RICHMOND ST STANDING
TOXAPHENE (NG/L)	SPECIFIC PESTICIDES			DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)
4 SAMPLES	BDL	BDL	BDL	BDL	BDL
2,4,5-T (NG/L)				DET'N LIMIT = 50.0	GUIDELINE = 280000 (A1)
8 SAMPLES	BDL	BDL	BDL		
2,4,0 (NG/L)				DET'N LIMIT = 100.0	GUIDELINE = 100000 (A1)
1991 JUN	210,000 <T	!NR			
1991 AUG	115	BDL			
1991 NOV	BDL	BDL			
1992 JUN	390,000 <T	450,000 <T			
1992 OCT	BDL	BDL			
2,4,0B (NG/L)				DET'N LIMIT = 200.0	GUIDELINE = N/A
8 SAMPLES	BDL	BDL	BDL		
2,4,0 PROPIONIC ACID (NG/L)				DET'N LIMIT = 100.0	GUIDELINE = N/A
1991 JUN	BDL	!NR			
1991 AUG	115	BDL			
1991 NOV	BDL	170,000 <T			
1992 JUN	300,000 <T	550,000 <T			
1992 OCT	BDL	BDL			
DICHLBABA (NG/L)				DET'N LIMIT = 50.0	GUIDELINE = 120000 (A1)
1991 JUN	1010,000	!NR			
1991 AUG	115	BDL			
1991 NOV	100,000 <T	140,000 <T			
1992 JUN	230,000 <T	260,000 <T			
1992 OCT	BDL	BDL			
2,4,5-TP (SILVEX) (NG/L)				DET'N LIMIT = 20.00	GUIDELINE = 10000 (A1)
8 SAMPLES	BDL	BDL	BDL		
DIAZINON (NG/L)				DET'N LIMIT = 20.0	GUIDELINE = 20000 (A1)
5 SAMPLES	BDL	BDL	BDL		
DICHLOROVOX (NG/L)				DET'N LIMIT = 20.0	GUIDELINE = N/A
5 SAMPLES	BDL	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM, 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DISI. SYSTEM MOONEY ST FREE FLOW	DISI. SYSTEM MOONEY ST STANDING	DISI. SYSTEM RICHMOND ST FREE FLOW	DISI. SYSTEM RICHMOND ST STANDING
SPECIFIC PESTICIDES					
CHLORPYRIFOS (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A
5 SAMPLES	BDL	BDL			
ETHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 35000 (G)
5 SAMPLES	BDL	BDL			
MALATHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 190000 (A1)
5 SAMPLES	BDL	BDL			
MEVINPHOS (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A
5 SAMPLES	BDL	BDL			
METHYL PARATHION (NG/L)			DET'N LIMIT = 50.0		GUIDELINE = 9000 (03)
5 SAMPLES	BDL	BDL			
METHYL TRITHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A
5 SAMPLES	BDL	BDL			
PARATHION (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 50000 (A1)
5 SAMPLES	BDL	BDL			
PHORATE (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = 2000 (A2)
5 SAMPLES	BDL	BDL			
RELDAN (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A
5 SAMPLES	BDL	BDL			
RONNEL (NG/L)			DET'N LIMIT = 20.0		GUIDELINE = N/A
5 SAMPLES	BDL	BDL			
CARBOFURAN (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = 90000 (A1)
7 SAMPLES	BDL	BDL			
CHLORPROPHAM (CIPC) (NG/L)			DET'N LIMIT = 2000.0		GUIDELINE = 350000 (G)
7 SAMPLES	BDL	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW
SPECIFIC PESTICIDES				
DIALLATE (NG/L) 7 SAMPLES	BDL	BDL	DET'N LIMIT = 2000.0	GUIDELINE = N/A
EPTAM (NG/L) 7 SAMPLES	BDL	BDL	DET'N LIMIT = 2000.0	GUIDELINE = N/A
IPC (NG/L) 7 SAMPLES	BDL	BDL	DET'N LIMIT = 2000.0	GUIDELINE = N/A
PROPOXUR (NG/L) 7 SAMPLES	BDL	BDL	DET'N LIMIT = 2000.0	GUIDELINE = 140000 (D3)
CARBARYL (NG/L) 7 SAMPLES	BDL	BDL	DET'N LIMIT = 200.0	GUIDELINE = 90000 (A1)
BUTYLATE (NG/L) 7 SAMPLES	BDL	BDL	DET'N LIMIT = 2000.0	GUIDELINE = 245000 (D3)
			BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT		TREATMENT PLANT		DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM	
RAW	TREATED	MOONEY ST	FREE FLOW	MOONEY ST	STANDING	RICHMOND ST	RICHMOND ST	RICHMOND ST	STANDING
VOLATILES									
BENZENE (UG/L)	40 SAMPLES	BDL	BDL	DET/N LIMIT = 0.05		GUIDELINE = 5 (A1)			
TOLUENE (UG/L)	)	BDL	BDL	DET/N LIMIT = 0.05		GUIDELINE = 24 (A3)			
ETHYLBENZENE (UG/L)	)	BDL	BDL	DET/N LIMIT = 0.05		GUIDELINE = 2.4 (A3)			
P-XYLENE (UG/L)	)	BDL	BDL	DET/N LIMIT = 0.10		GUIDELINE = 300 (A3 ^a)			
40 SAMPLES									
1991 FEB	BDL	BDL	BDL	.150 < T		BDL			
1991 APR	BDL	BDL	BDL	.150 < T			.050 < T		
1991 JUN	BDL	BDL	BDL	.250 < T			BDL		
1991 AUG	BDL	BDL	BDL	.250 < T			BDL		
1991 OCT	BDL	BDL	BDL	.050 < T			BDL		
1991 NOV	BDL	BDL	BDL	.050 < T			BDL		
1992 FEB	.050 < T	BDL	BDL	.050 < T			BDL		
1992 MAY	BDL	BDL	BDL	.050 < T			BDL		
1992 JUN	BDL	BDL	BDL	.100 < T			BDL		
1992 AUG	BDL	BDL	BDL	.100 < T			BDL		
1992 OCT	BDL	BDL	BDL	.100 < T			BDL		
1992 DEC	BDL	BDL	BDL	.100 < T			BDL		
1991 FEB	.100 < T	BDL	BDL	.050 < T			BDL		
1991 APR	BDL	.050 < T	BDL	.050 < T			.050 < T		
1991 JUN	BDL	.050 < T	BDL	.050 < T			BDL		
1991 AUG	BDL	.150 < T	BDL	.100 < T					
1991 OCT	.100 < T	BDL	.150 < T	.050 < T					
1991 NOV	.100 < T	BDL	.100 < T	.100 < T					
1992 FEB	.050 < T	BDL	.100 < T	.100 < T					
1992 MAY	BDL	.150 < T	BDL	.100 < T					
1992 JUN	BDL	.100 < T	BDL	.150 < T					
1992 AUG	.100 < T	BDL	.100 < T	.150 < T					
1992 OCT	BDL	.100 < T	BDL	.100 < T					
1992 DEC	.150 < T	BDL	.100 < T	.200 < T					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM		DIST. SYSTEM		DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
		MOONEY ST FREE FLOW	STANDING	MOONEY ST FREE FLOW	STANDING		
VOLATILES							
H-XYLENE (UG/L)	)					DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O-XYLENE (UG/L)							
1991 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
STYRENE (UG/L)							
1991 FEB	.150 <T	.050 <T	.050 <T	.150 <T	.150 <T	.100 <T	.100 <T
1991 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	.150 <T	.150 <T	.150 <T	.150 <T	.150 <T	.100 <T	.200 <T
1991 NOV	.100 <T	.100 <T	.100 <T	.100 <T	.100 <T	.100 <T	.100 <T
1992 FEB	.200 <T	.200 <T	.200 <T	.200 <T	.200 <T	.250 <T	.250 <T
1992 MAY	.050 <T	.050 <T	.050 <T	.050 <T	.050 <T	.200 <T	.200 <T
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-DICHLOROETHYLENE (UG/L)							
40 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT RAW	PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
METHYLENE CHLORIDE (UG/L)			DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)
40 SAMPLES	BOL	BOL	BOL		BOL
112-01 CHLOROETHYLENE (UG/L)			DET'N LIMIT = 0.10		GUIDELINE = 70 (D1)
40 SAMPLES	BOL	BOL	BOL		BOL
1,1-DICHLOROETHANE (UG/L)			DET'N LIMIT = 0.100		GUIDELINE = N/A
40 SAMPLES	BOL	BOL	BOL		BOL
CHLOROFORM (UG/L)			DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)
1991 FEB	BOL	28.300	22,000		22,400
1991 APR	BOL	54,000	49,200		44,200
1991 JUN	BOL	74,000	50,000		55,600
1991 AUG	BOL	50,700	39,500		
1991 OCT	BOL	44,100	37,600		32,900
1991 NOV	BOL	47,100	38,200		
1992 FEB	BOL	26,000	21,500		
1992 MAY	BOL	41,800	14,800		
1992 JUN	.400 <T	49,200	48,600		
1992 AUG	BOL	64,500	90,700		
1992 OCT	BOL	69,300	55,800		
1992 DEC	BOL	44,700	37,100		
111,TRICHLOROETHANE (UG/L)					
1991 FEB	BOL	BOL	BOL		GUIDELINE = 200 (D1)
1991 APR	BOL	BOL	BOL		BOL
1991 JUN	BOL	BOL	BOL		BOL
1991 AUG	BOL	BOL	BOL	.060 <T	BOL
1991 OCT	BOL	BOL	BOL		
1991 NOV	BOL	BOL	BOL		
1992 FEB	BOL	BOL	BOL		
1992 MAY	BOL	BOL	BOL		
1992 JUN	BOL	BOL	BOL		
1992 AUG	BOL	BOL	BOL		
1992 OCT	BOL	BOL	BOL		
1992 DEC	BOL	BOL	BOL		
1,2 DICHLOROETHANE (UG/L)					
40 SAMPLES	BOL	BOL	BOL		GUIDELINE = 5 (A1)

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
CARBON TETRACHLORIDE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	BDL
1,2-DICHLOROPROpane (UG/L)				
40 SAMPLES	BDL	BDL	BDL	BDL
TRICHLOROETHYLENE (UG/L)				
1991 FEB	BDL	BDL	BDL	BDL
1991 APR	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	•100 <1	
1992 JUN	BDL	BDL	BDL	
1992 AUG	BDL	BDL	BDL	
1992 OCT	BDL	BDL	BDL	
1992 DEC	BDL	BDL	•100 <1	
1,1,1-TRICHLOROBROMOMETHANE (UG/L)				
1991 FEB	BDL	10,000	6,300	7,400
1991 APR	BDL	15,750	12,900	12,750
1991 JUN	BDL	19,100	14,800	15,300
1991 AUG	BDL	17,650	13,400	
1991 OCT	BDL	14,450	10,900	11,250
1991 NOV	BDL	14,000	10,800	
1992 FEB	BDL	13,100	10,500	
1992 MAY	BDL	11,800	4,800	
1992 JUN	BDL	16,700	16,250	
1992 AUG	BDL	18,550	23,650	
1992 OCT	BDL	19,850	17,000	
1992 DEC	BDL	17,150	11,900	
112-TRICHLOROETHANE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TABLE 4
FOR INKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM MOONEY ST STANDING	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
VOLATILES					
1,2,0-CHLOROBENZENE (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 200 (A1)
40 SAMPLES	BDL	BDL	BDL		BDL
ETHYLENE DIBROMIDE (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 50 (D1)
40 SAMPLES	BDL	BDL	BDL		BDL
TOTAL TRIHALOMETHANES (UG/L)					
			DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)
1991 FEB	BDL	39.800	29.450		31.150
1991 APR	BDL	73.000	64.950		59.450
1991 JUN	BDL	96.000	67.500		73.300
1991 AUG	BDL	71.850	55.800		
1991 OCT	BDL	60.850	50.300		45.950
1991 NOV	BDL	63.400	51.000		
1992 FEB	BDL	42.100	35.000		
1992 MAY	BDL	55.100	20.900		
1992 JUN	BDL	69.300	68.050		
1992 AUG	BDL	86.150	117.650		
1992 OCT	BDL	92.550	76.300		
1992 DEC	BDL	65.050	51.300		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM, 1991 AND 1992 DRESDEN WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM MOONEY ST FREE FLOW	DIST. SYSTEM RICHMOND ST FREE FLOW	DIST. SYSTEM RICHMOND ST STANDING
RADIONUCLIDES				
COBALT 60 (Bq/L)				GUIDELINE = N/A
8 SAMPLES	BOL	BOL		
CESTUM 134 (Bq/L)			DET'N LIMIT = 0.70	GUIDELINE = N/A
8 SAMPLES	BOL	BOL		
CESTUM 137 (Bq/L)			DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)
8 SAMPLES	BOL	BOL		
GROSS ALPHA COUNT (Bq/L)			DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)
1991 FEB	.100	.110		
1991 JUN	BOL	BOL		
1991 AUG	BOL	BOL		
1992 MAY	.460	.050		
GROSS BETA COUNT (Bq/L)			DET'N LIMIT = 0.04	GUIDELINE = N/A
1991 FEB	.230	.180		
1991 JUN	.180	.100		
1991 AUG	.110	.090		
1992 MAY	.860	.100		
TRITIUM (Bq/L)			DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)
1991 FEB	9,000	9,000		
1991 JUN	10,000	BOL		
1991 AUG	BOL	12,000		
1992 MAY	BOL	BOL		
100 INE 131 (Bq/L)			DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)
8 SAMPLES	BOL	BOL		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FEAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
DIEDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXAChLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)

PHENOLICS

PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
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SPECIFIC PESTICIDES

2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEK)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A
DIALLATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLGRAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A

VOLATILES

1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROpane	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLOROIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

Equal to 15.0 Picocuries/litre

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C₆H₆

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 µg/L

SYNOMYS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27)
BOILING POINT: 80.1°C (27)
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)
LOG OCT./WATER PARTITON COEFFICIENT: 1.95 TO 2.13 (39)
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	<ul style="list-style-type: none">-500 mL plastic bottle (PET 500)-rinse bottle and cap with sample water three times-fill to 2 cm from top
Bacteriological	<ul style="list-style-type: none">-220 mL plastic bottle with white seal on cap-do <u>not</u> rinse bottle, preservative has been added-avoid touching bottle neck or inside of cap-fill to top of red label as marked
Metals	<ul style="list-style-type: none">-500 mL plastic bottle (PET 500)-rinse bottle and cap three times-fill to 2 cm from top-add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	<ul style="list-style-type: none">-45 mL glass vial with septum (teflon side must be in contact with sample)-do <u>not</u> rinse bottle-fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	<ul style="list-style-type: none">-1 L amber glass bottle per scan-do <u>not</u> rinse bottle-fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	<ul style="list-style-type: none">-as per Organics-three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	<ul style="list-style-type: none">-1 L amber glass bottle per scan-do <u>not</u> rinse bottle-fill to 2 cm from top-add 25 drops of sodium thiosulphate
Cyanide (Treated only)	<ul style="list-style-type: none">-500 mL plastic bottle (PET 500)-rinse bottle and cap three times-fill to 2 cm from top-add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	<ul style="list-style-type: none">-250 mL glass bottle-rinse bottle and cap three times-fill to top of label-add 20 drops each nitric acid (HNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO ₃) (Caution: HNO ₃ is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	<ul style="list-style-type: none">-500 mL plastic bottle (PET 500)-rinse bottle and cap with sample water three times-fill to 2 cm from top
Bacteriological	<ul style="list-style-type: none">-250 mL plastic bottle with white seal on cap-do <u>not</u> rinse bottle, preservative has been added-avoid touching bottle neck or inside of cap-fill to top of red label as marked
Metals	<ul style="list-style-type: none">-500 mL plastic bottle (PET 500)-rinse bottle and cap three times-fill to 2 cm from top-add 10 drops nitric acid HNO₃(Caution: HNO₃ is corrosive)
Volatiles (duplicate) (OPOPUP)	<ul style="list-style-type: none">-45 mL glass vial with septum (teflon side must be in contact with sample)-do <u>not</u> rinse bottle, preservative has been added-fill bottle completely without bubbles
Organics (OWOC)	<ul style="list-style-type: none">-1 L amber glass bottle per scan-do <u>not</u> rinse bottle-fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	<ul style="list-style-type: none">-1 L amber glass bottle per scan-do <u>not</u> rinse bottle-fill to 2 cm from top-add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.
2. Let cold water flow for five minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

